ANNUAL ADMINISTRATIVE REPORT (FY2003) AND WORK PLAN (FY 2004) FOR INVENTORIES AND VITAL SIGNS MONITORING

FY2003-FY2004

EASTERN RIVERS AND MOUNTAINS NETWORK

New River Gorge National River (NERI)
Bluestone National Scenic River (BLUE)
Gauley River National Recreation Area (GARI)
Johnstown Flood National Memorial (JOFL)
Fort Necessity National Battlefield (FONE)
Friendship Hill National Historic Site (FRHI)
Upper Delaware Scenic and Recreational River (UPDE)
Delaware Water Gap National Recreation Area (DEWA)
Allegheny Portage Railroad National Historic Site (ALPO)
Appalachian National Scenic Trail (APPA)

Eastern Rivers and Mountains Network Approval Signatures

Signatory, Network Board of Directors (John Karish) Date

Elizabeth Johnson, Regional Inventory and Monitoring Coordinator, Northeast Region Date

Prepared by: Matt Marshall, Eastern Rivers and Mountains Network Coordinator Date

	Budget program (MS Access, aarwp_budget.mdb)
XP	Which version of Access did you use? [Enter 97 or XP for Access 97 or Access XP at the beginning of this line.]
x	The income amounts entered for Biological Inventories, Vital Signs Monitoring, Prototype $$ - Annual Transfer, Water Quality Monitoring and other sources matches the dollar amounts from the memos sent to the regions/networks by WASO (have you used the correct income amounts?).
x	In the Add/Edit Budget Records form, the amount shown for Total Expenses matches that for Total Income. (If it doesn't, enter a record under Expenses in the 7_Other category to make it balance; use an entry such as 'Unexpended funds' or 'Overspent Funds' in the Description column to explain the amount.)
x	For all Expense records, the Description field includes the name of the university, agency, company, or other vendor to help us document our outsourcing efforts. (If this expense involved a contract, cooperative agreement, interagency agreement, or other partnership, is it clear where the money went?)
x	For all Expense records, the correct item from the picklist for 'Where $$ Went' has been entered. [Think about who the check was written to; e.g., enter 'Other Non-Federal' for funding that went directly to the private sector, such as for purchases (computers, supplies, etc.), travel (airlines, rental cars, hotels).]
x	On the Status of Biological Inventories form, there is one record for each inventory that is described in the text section of the AARWP or the budget program for FY 2000-2003 (data should be included for previous years since this is our first year of building this database). Be sure to list each park that was involved in the particular inventory.
x	Each year's budget has been exported as an .rtf file (one for FY 2003 and one for FY 2004), and both files have been inserted into MS Word at the end of the AARWP document.
x	The file aarwp_budget.mdb has been renamed to include the 4-character network alpha code and the years, as shown in this example: NCCN_FY0304_aarwp.mdb
	Annual Report and Work Plan (MS Word)
x	I have carefully read the guidance for the AARWP and followed it.
x	A header or footer with the date that the aarwp was last revised has been included.
x	I gave special attention to the 'Public Interest Highlights' and 'Major Accomplishments' sections of the report. (We need good examples of the successes, applications, and highlights of the program to help us obtain funding for all 32 networks! Your 'Major Accomplishments' section is what we'll use for the I&M Program's annual Report to Congress to justify the funding spent by your network.)
x	In the 'Status of Park Vital Signs Monitoring' table, all entries are equal to or greater than the entries in last year's report.
NA	Photographs that might be included in one of the reports to Congress, brochures, websites, or other materials that help the program have been submitted by the network. (See the guidelines for submitting photographs.)
x	The aarwp file has been renamed using the network's 4-character alpha code and the years (FY0304) as in the example NCCN_ FY0304_aarwp.doc
x	The annual report has been approved by the appropriate individuals, per my region's procedures. (If you cannot get electronic signatures, it is okay to submit a hard copy with signatures after November 8.)
x	I have followed my region's procedures for submitting the two files (e.g., NCCN_ FY0304_aarwp.doc and NCCN_ FY0304_aarwp.mdb). (Most regions require you to submit the files through the regional office. The files may be zipped into a zip file if desired, and then submitted to Steven Fancy via either email or ftp).
	Review of FY 2004 Work Plan by WASO
YES	[Enter Yes or No]: Has the FY 2004 workplan been approved by the network Board of Directors, and therefore ready for the full WASO review? (If you enter No, the WASO I&M and WRD offices will only briefly review the work plan for 'red flags'.

I. OVERVIEW AND OBJECTIVES

The Eastern Rivers and Mountains Network (ERMN) includes ten parks located in four states: New York, New Jersey, Pennsylvania, and West Virginia. A relatively small segment of the Appalachian Trail in PA and NJ is included in the ERMN, but trail activities associated with the Inventory and Monitoring Program are currently coordinated by the Northeast Temperate Network. The ERMN parks range in size from approximately 66 to 30,000 hectares and generally consist of a mosaic of forested hillsides and floodplains, streams and rivers, tallus slopes and cliffs, vernal pools and wetlands, open fields and agriculture. The river parks contain some of the most significant water resources and water-based recreational activities in the National Park system. These parks are not immune to a variety of natural and anthropogenic disturbances that affect, or have the potential to affect, park resources. Knowing the condition of natural resources and potential stressors is fundamental to protecting and managing National Park Service lands. Scientifically credible data are necessary to make decisions and support management actions. The purpose of the Inventory and Monitoring Program is to develop broadly based, scientifically sound information on the current status and long-term trends in the composition, structure and function of park ecosystems.

As part of the accountability system of the Inventory and Monitoring Program, submission of a detailed Annual Administrative Report and Work Plan (AARWP) to the National Program office is required. Approval of the AARWP by the Network's Board of Directors is also required. Review of this document is a primary means by which Network parks can remain current, track progress, and maintain oversight of the ERMN Inventory and Monitoring Program.

In FY 2003, the network received start up funds to hire a network coordinator and data manager. The Board agreed on Penn State University as a duty station for network staff. Matt Marshall was recently hired to fill the Network Coordinator position and Nathan Piekielek has filled the Data Manager position. A Network Science Advisory Committee is also being organized to assist and oversee program development.

Projects that are ongoing in the Network include compiling and entering existing and legacy data into the three WASO databases (NPSpecies, NatureBib and the Dataset Catalog). Two research associates and one volunteer are working to complete legacy data entry for the Network. The cooperative agreement with Penn State University to update Naturebib for the four Northeast Region Networks, including the ERMN has been extended, and the research associate has been visiting each park to search for new documents and update existing information. Numerous vertebrate and vascular plant inventories are being conducted in each park, and some aspect of the vegetation mapping effort is underway in all nine parks. Current and newly initiated inventory projects are part of the FY04 Work Plan while additional monitoring funding for the Network adds a different focus to FY04 Network activities. We are now planning to engage in several projects that will provide critical information needed to develop a long-term monitoring strategy.

OBJECTIVES FOR INVENTORIES

1. Locate and catalog Network park natural resource documents, data sets, and spatial information and ensure such information is accurate, readily available, and entered into NPS databases.
2. Conduct inventories targeted at taxonomic groups that are below the service-wide goal of 90% verification, or are of special concern to Network parks.
3. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

OBJECTIVES FOR VITAL SIGNS MONITORING

4. Hire and retain professional staff and secure office space and facilities.
5. Develop and maintain working and decision-making processes that engage the Board of Directors, Science Advisory Committee, technical staff, and managers of Network parks.
6. Summarize existing data, identify, and prioritize all indicators, then develop protocols and implement programs to monitor the Vital Signs.
7. Implement and maintain an integrated GIS and data management program (Note: this objective is placed under Vital Signs Monitoring, however, it is equally important and integrated with the Inventories portion of the program.).
8. Develop and maintain strategies to share information with Network parks, scientists, and others interested in the Network's I&M program, and to contribute to general management planning, educational programs, and learning centers for Network parks.

OBJECTIVES FOR WATER QUALITY MONITORING

9. Summarize existing data, identify and prioritize all aquatic indicators, and develop protocols and implement programs to monitor the Water Quality Vital Signs.

II. ACCOMPLISHMENTS (FY2003) AND SCHEDULED ACTIVITIES (FY2004)

A. INVENTORIES

OBJECTIVE 1 – Locate and catalog Network park natural resource documents, data sets, and spatial information and ensure such information is accurate, readily available, and entered into NPS databases

Task 1.1 – NPSpecies
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE

- **FY 2003 Accomplishments:** (1) Through an existing cooperative agreement with Penn State University, a part-time research associate (Jennifer Keefer) continued to mine, convert and verify existing data in the Network's NPSpecies databases for FONE, FRHI, ALPO, and JOFL (this position is shared between two Networks, the Mid-Atlantic and Eastern Rivers and Mountains). Existing records in NPSpecies were verified and corrected in association with the original hard copy documents. This included verifying each species with its associated reference, identifying species in the database not referenced and removing them, adding or removing documented common or scientific names, and adding location, abundance, and nativity information. Spelling errors are also being corrected, and any new data gathered in 2002/2003 entered. (2) A cooperative agreement with Penn State University was initiated for a part-time research associate (Janice Lynch) to mine for data on vertebrates and vascular plants found at UPDE. This information has been and will continue to be entered into NPSpecies. (3) Regional I&M staff at URI compiled and entered existing vertebrate and vascular plant data through 2001 into NPSpecies for NERI, BLUE and GARI. These data have been verified with the original, hard copy documents and all three databases submitted to WASO for upload to the web version of NPSpecies. (4) Park staff at DEWA (Jeff Shreiner) continued to review and verify NPSpecies data.
- **Scheduled FY 2004 Activities and Products:** (1) Maintain the existing cooperative agreements to continue the data mining, entering and verification process for NPSpecies for all Parks, and to centralize management of all Network NPSpecies related activities with the Network Data Manager at Penn State University. (2) An agreement will be established to provide housing for a volunteer at DEWA to enter data into NPSpecies. (3) Assist all Network parks in reviewing their park databases and in some cases hire taxonomic specialists to review NPSpecies for the Network. (4) Ensure that data collected under current cooperative agreements be entered into NPSpecies and other appropriate NPS databases.

Task 1.2 NatureBib
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE

- **FY 2003 Accomplishments**: Through an existing cooperative agreement with Penn State University, a full-time research associate (Scott Tiffney) entered, updated and verified existing references in the NPS bibliographic database, NatureBib. This is a shared position between the four Northeast Region Networks. Scott Tiffney: (1) Visited ALPO, BLUE, FONE, FRHI, GARI, JOFL, NERI, UPDE, to assess the status of parks' NatureBib databases and onsite collections, (2) Updated park NatureBib databases and added new records: ALPO (19 records), BLUE (8 records), FONE (14 records), FRHI (6 records), GARI (30 records), JOFL (15 records), NERI (134 records), and UPDE (132 records). (3) Edited Park NatureBib

database records for duplication, spelling, authority control and data comprehensiveness: ALPO (11 records), BLUE (22 records), FONE (37 records), FRHI (4 records), GARI (27 records), JOFL (12 records), NERI (78 records), and UPDE (34 records). (4) Received and fulfilled NatureBib data requests from park personnel, government agencies, academic staff and students, researchers, and interested private citizens: Patricia Lolavera (NPS, 48 citations), Clif Bobiniski (NPS, 31 citations), and Jennifer DeCecco (Pennsylvania State University-NPS, 4984 citations).

- **Scheduled FY 2004 Activities and Products:** (1) Maintain the existing cooperative agreements to ensure that NatureBib updating, editing and request fulfilling will continue at all Parks as needed. (2) Quarterly progress reports are due in November 2003, March 2004, and July 2004.

Task 1.3 Peer review process for biological inventory work
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE

- **FY2003 Accomplishments**: (1) An existing cooperative agreement with Penn State University was extended to provide funding to staff (Dr. Richard Yahner) to review incoming biological inventory data and reports for the ERM Network as well as some projects being conducted in Mid-Atlantic Network parks.
- **Scheduled FY 2004 Activities and Products**: (1) Maintain the existing cooperative agreements to continue peer review as data and reports are submitted to the Networks.

OBJECTIVE 2 – Conduct inventories targeted at taxonomic groups that are below the service-wide goal of 90% verification, or are of special concern to Network parks.

Task 2.1 – Amphibian, Reptile and Mammal Inventories
Parks Involved: ALPO & JOFL

- **FY 2003 Accomplishments:** Dr. Richard Yahner at The Pennsylvania State University continued to inventory amphibian, reptile, and mammal species at ALPO and JOFL. The objectives of the project are to: (1) Review existing literature and documentation of the National Park Service and other sources and develop a database for historic and potential occurrence of amphibians, reptiles, and mammals at ALPO and JOFL, (2) Obtain a comprehensive inventory data set (based on 2 years) on amphibians, reptiles, and mammals at ALPO and JOFL, (3) Provide an assessment of the status of amphibians, reptiles, and mammals at ALPO and JOFL and recommend management objectives for ecological monitoring. In FY03, draft study and survey plans were completed, field and data technicians were hired, and preliminary survey locations were established.
- **Scheduled FY 2004 Activities and Products:** (1) Oct 2003 - 2004 historical records research and compilation will be conducted by Penn State, (2) Dec 2003 survey locations will be finalized and cover items for amphibians and reptiles will be placed at each survey station, (3) Mar - Oct 2004 the first year of amphibian, reptile, mammal, and woody plant surveys will be conducted at ALPO and JOFL.

Task 2.2 – Bird and Mammal Inventories
Parks Involved: FONE & FRHI

- **FY 2003 Accomplishments:** Dr. Richard Yahner and Brad Ross at The Pennsylvania State University continued to inventory bird and mammal species at FONE and FRHI. The

objectives of the project are to: (1) Review existing literature and documentation of the National Park Service and other sources and develop a database for historic and potential occurrence of birds and mammals at FONE and FRHI, (2) Obtain a comprehensive inventory data set (based on 2 years) on birds and mammals at FONE and FRHI, (3) Provide an assessment of the status of birds and mammals at FONE and FRHI, and recommend management objectives for ecological monitoring. As of FY03, avian surveys were conducted from September 2001 through July 2003 at FONE and FRHI using unlimited radius point-count survey, strip-transect, vehicular road, diurnal raptor and vulture, nocturnal owl, and riparian bird survey protocols. They detected 127 and 138 bird species at FONE and FRHI, respectively including 21 bird species of special concern at each park. Mammal surveys were conducted beginning in July 2002 and will conclude during the first week of October 2003. Surveys were conducted using various sizes and types of live traps, vehicular road survey protocol, and through identification of any mammal tracks, fecal samples, or sign of mammals while conducting research within the parks. They detected 21 and 15 mammalian species at FONE and FRHI, respectively including the fisher, which has recently been reintroduced into Pennsylvania. The investigators measured vegetation characteristics at bird point-count and mammal trapping sampling points during July and August 2003.

- **Scheduled FY 2004 Activities and Products:** (1) Cooperators will conclude the research, as the final mammal surveys will be conducted during the first week of October. (2) Oct 2003 - Mar 2004 cooperators will submit NPS Technical Report for the project. (3) Dec 2003 - Oct 2004 cooperators will work on manuscripts based on the research for publication in scientific journals.

Task 2.3 – Bat Community Composition, Relative Abundance and Distribution
Parks Involved: NERI, GARI, & BLUE

- **FY 2003 Accomplishments:** (1) A FY02 interagency agreement was established with W. Mark Ford at the USDA Forest Service and Dr. Steven Castleberry at the University of Georgia and to conduct a baseline inventory of bat community composition, relative abundance and distribution at NERI, BLUE and GARI. Field work began in 2003 with a graduate level research assistant using Anabat ultrasonic detectors to record calls at 283 discrete points in a variety of habitats throughout the three parks. These records are currently being identified to the species level. Occasional mist netting was performed to support Anabat findings and to investigate the presence of *Corynorhinus* sp. Unfortunately, a high frequency of rain in the three parks and technical and other difficulties greatly reduced data collection.
- **Scheduled FY 2004 Activities and Products:** (1) Fieldwork will continue in 2004. Data collected during summer months of 2003 will be used to create habitat foraging models for each species detected in the three parks. A final report will be generated detailing habitat characteristics selected by each species and showing ideal foraging habitat maps for each of the species found in the three parks. A bat call library of each species will be submitted for land manager's reference. Voucher photographs of all species captured will be submitted.

Task 2.4 – Bird Communities in Hemlock Ecosystems
Parks Involved: NERI & GARI

- **FY 2003 Accomplishments:** (1) Songbird surveys were completed in 36 hemlock monitoring plots by Dr. Petra Wood, WV Cooperative Fish and Wildlife Research Unit. The

most common species detected included hooded warbler, ovenbird, red-eyed vireo, and wood thrush. Data were entered into an excel spreadsheet and proofed and the data dictionary was updated. The NERI Resource Manager has not detected hemlock woolly adelgid on these plots, although they have been detected elsewhere in the park. Therefore, no changes in the vegetation nor in the associated bird community have been detected.

- **Scheduled FY 2004 Activities and Products:** (1) Existing data will be summarized and a final project report prepared. Data will be entered into NPSpecies.

Task 2.5 – Grassland Bird Inventory
Parks Involved: DEWA

- **FY 2003 Accomplishments:** (1) A FY02 cooperative agreement was established with East Stroudsburg University, Dr. Terry Master, to inventory grassland birds at DEWA. Field work began in the summer of 2002 and was completed in July 2003 by Terry Master and four of his graduate students. The project involved sampling a subset of field habitats within the park using variable circular plot point counts and program DISTANCE to determine distribution and some measure of occurrence, either density or detection frequency, depending upon the sample size derived for a given species. These parameters will be related to field characteristics, including vegetative composition/structure, and physical attributes such as area and shape. Analyses are ongoing, but initial analyses show that 88 species were detected with 12 frequently enough for statistical analysis. Of these, the Field Sparrow (*Spizella pusilla*) was the most frequently detected obligate grassland species in DEWA.
- **Scheduled FY 2004 Activities and Products:** (1) Analyses, final report and database are due in December 2003 and will be reviewed in 2004.

Task 2.6 – Wetland Bird Inventory
Parks Involved: DEWA

- **FY 2003 Accomplishments:** (1) A cooperative agreement was established with East Stroudsburg University, Dr. Terry Master, to inventory wetland birds at DEWA. The surveys will be based upon variable circular plot point counts modified somewhat for use in wetlands. The majority of wetlands in DEWA are relatively small palustrine wetlands, many resulting from beaver activity and most consisting of a combination of forested, shrub-scrub and emergent types.
- **Scheduled FY 2004 Activities and Products:** (1) Fieldwork is to begin during the spring of 2004. The primary tasks during spring of 2004 will be to select a subset of wetlands to be sampled and conduct the subsequent point counts.

Task 2.7 – Bat Survey of Abandoned Mine Portals
Parks Involved: NERI & GARI

- **FY 2003 Accomplishments:** (1) In FY02, NERI supported a one season project through park funding to conduct a baseline inventory of bats utilizing abandoned mine portals at NERI. Field work was conducted in the summer of 2002 by Dr. Petra Wood and other researchers from West Virginia University. During this inventory, a very rare species was caught, Rafinesque's big-eared bat. This discovery is only the third record for this species in West Virginia. In FY03, an amendment to the cooperative agreement with West Virginia University was made and the ERMN funded a survey of bats utilizing the abandoned mine

portals at GARI. Field work was conducted in the fall of 2002 by the same team that conducted the work at NERI with a report submitted January 28, 2003.

- **Scheduled FY 2004 Activities and Products:** Project complete. Data and report being reviewed for metadata creation and data will be entered into NPSpecies.

Task 2.8 – Fish Inventory
Parks Involved: NERI, GARI & BLUE

- **FY 2003 Accomplishments:** (1) A FY01 interagency agreement was established with Dr. Stuart Welsh, U.S. Geological Survey, West Virginia Cooperative Fish and Wildlife Research Unit, to inventory fish species in the mainstem and tributaries of NERI. Park funds were used fund Dr. Welsh for a fish inventory of GARI. The GARI project comprises part of the graduate student theses for Laura Carr at WVU. Dr. Welsh, Ms. Carr, and Dan Cincotta (WV DNR) surveyed all but one of the selected sites in 2003. The research team combined recent data with historic data, and is currently reviewing museum information before completion of final reports.
- **Scheduled FY 2004 Activities and Products:** (1) Draft and final inventory reports for NERI and GARI will be submitted in late 2003 and early 2004. (2) An additional study on the introduced variegate darter and its impacts on the endemic candy darter will occur in spring and summer 2004. (3) The existing (or new) agreement will modified to initiate an inventory of fish species in the mainstem and tributaries of the BLUE beginning in the spring of 2004.

Task 2.9 – Reptile and Amphibian Inventory
Parks Involved: FONE & FRHI

- **FY 2003 Accomplishments**: (1) Continued effort was made to receive final report, data, and other deliverables from Dr. Brian K. Paulson at California University of PA for a previously funded project to inventory amphibians and reptiles and FONE and FRHI. A final report was received and reviewed by John Karish in Aug 2002 and returned to Dr. Paulson.
- **Scheduled FY 2004 Activities and Products:** (1) Revised final report, data, and other deliverables to be received from Dr. Paulson.

Task 2.10 – Amphibian and Reptile Inventory
Parks Involved: GARI

- **FY 2003 Accomplishments:** (1) The final year of a three year herpetological inventory of GARI by Marshall University cooperators, Drs. Thomas Pauley and Mark B. Watson, was funded by the Network in FY02. (2) During the FY03 reporting period 77 new sites were searched and 11 species of salamanders, 2 species of toads, 6 species of frogs, 1 species of turtle, 1 species of lizard, and 9 species of snakes were located. Two new species of snakes were added. (3) To date, they have observed 17 of 21 potential species of salamanders (81%), 9 of 9 potential species of toads and frogs (100%), 2 of 6 potential species of turtles (33%), 3 of 5 species of potential lizards (60%), 12 of 16 species of snakes (75%). Overall, they have located 43 of 57 potential species (75%). (4) All sites have GPS coordinates and all data have been entered into the NPS database format. (5) Herpetological inventories will continue through this fall and early winter.
- **Scheduled FY 2004 Activities and Products:** (1) Receive final report and deliverables from Marshall University cooperators for GARI.

Task 2.11 – Historical Vertebrate Inventory Data Management
Parks Involved: NERI, GARI & BLUE

- **FY 2003 Accomplishments:** (1) Through a FY02 cooperative agreement with Marshall University, Dr. Thomas Pauley, with the assistance of regional I&M staff, developed relational databases in MS Access to be populated with Dr. Pauley's previously collected vertebrate data from NERI, BLUE and GARI. This project was scheduled to be completed in 2003, but was not. (2) In 2003, all upland vertebrate data was entered into the database, cross referenced, and WVBS museum record numbers were added for specimens collected during the study. Data collected from Dr. Pauley's vertebrate study of BLUE was transferred into the Access database. The GARI vertebrate study data was imported into the NPS format database. (3) Q/A measures were initiated. All data from each database was compared to field records when available. Spatial data were plotted in ArcView and GIS maps were compared to topographical maps made during field studies. Unfortunately, avian and mammal data from the subcontractor who conducted this part of the study are not available. These data will be added to the databases when they are received.
- **Scheduled FY 2004 Activities and Products:** (1) Receive all deliverables following I&M specifications for Marshall University database development and legacy data conversion project for NERI and BLUE, as well as for the GARI herpetological inventory project currently being completed. (2) Seek review of spatial components of these data.

Task 2.12 – Fish Inventory
Parks Involved: DEWA & UPDE

- **FY 2003 Accomplishments:** (1) A cooperative agreement was established with the Academy of Natural Sciences of Philadelphia, Dr. Richard Horwitz and Paul Overbeck, to conduct a fish inventory of species of concern at DEWA and UPDE.
- **Scheduled FY 2004 Activities and Products:** (1) Field work will begin in spring of 2004.

Task 2.13 – Compilation of Historic Data for Fishes of the Northeast Region
Parks Involved: FONE, FRHI, ALPO, JOFL, DEWA, UPDE, NERI, GARI & BLUE

- **FY 2003 Accomplishments:** (1) Continued effort of regional I&M staff (Sara Stevens) to develop database format to assist completion of past project with Penn State University (Dr. Jay Stauffer and Tim Stecko) from an earlier cooperative agreement.
- **Scheduled FY 2004 Activities and Products:** (1) Project will be completed and final deliverables received.

Task 2.14 – Determine Status and Trends of Mussels
Parks Involved: NERI

- **FY 2003 accomplishments:** (1) An existing cooperative agreement with Marshall University, Dr. Ralph Taylor, was modified to perform the first mussel inventory since 1985 at NERI. Funding came from BRMD. Dr. Taylor was assisted by Dr. Tom Jones and two graduate students. Preliminary surveys of 20 sites produced over 1700 individuals in the New River. All sites have been GPSed, and color photographs have been taken of most species encountered. These surveys have led to the selection of some sites for more in-depth analysis.
- **Scheduled FY 2004 Activities and Products:** (1) Complete initial evaluation of remaining stretch of New River. (2) Conduct in-depth evaluations of selected mussel beds for species

composition and density. (3) Prepare final report describing findings and comparing mussel populations and communities with historical surveys to determine status and trends. (4) Provide high-quality photographs of representatives of each species for identification and education purposes. (5) Provide GIS layer of findings.

Task 2.15 – Determine Status and Trends of Crayfish
Parks Involved: NERI

- **FY 2003 accomplishments:** (1) NERI park funds were used to fund (modifying an existing agreement for mussel inventory) Dr. Tom Jones, Marshall University, to perform the first crayfish assessment since 1985 in NERI. Dr. Jones was assisted by Dr. Ralph Taylor and two graduate students. This project was funded late in FY03, and only preliminary site evaluations have been made.
- **Scheduled FY 2004 Activities and Products:** (1) Complete initial site evaluation of the New River and its tributaries. (2) Conduct in-depth evaluations of crayfish populations and communities in selected high-value habitats. (3) Examine selected marginal habitats for uncommon or unrecorded species. (4) Prepare final report describing findings and comparing crayfish populations and communities with historical surveys to determine status and trends. (5) Provide high-quality photographs of representatives of both sexes of each species for identification and education purposes. (6) Provide GIS layer of findings.

Task 2.16 – Flying Squirrel Inventory
Parks Involved: DEWA

- **FY 2003 Accomplishments:** (1) A cooperative agreement was established with East Stroudsburg University, Dr. Howard P. Whidden, to conduct surveys for the Northern Flying Squirrel (*Glaucomys sabrinus*) in DEWA. Appropriate habitat appears to be available in the park, but this species of special concern has not previously been recorded.
- **Scheduled FY 2004 Activities and Products:** (1) Surveys will begin in the fall of 2003 and continue into 2004.

Task 2.17 – Plant Community Mapping and Surveys for Species of Special Concern.
Parks Involved: ALPO, JOFL, FONE, FRHI

- **FY 2003 Accomplishments:** (1) Western Pennsylvania Conservancy (WPC) biologists completed the mapping, ground-truthing, and description of plant communities and other land cover types at ALPO, JOFL, FRHI, and FONE from October to December 2002. Funds were originally provided by Regional Science. Where possible, community types were described according to Fike 1999 (Terrestrial and Palustrine Plant Communities of Pennsylvania, PA Department of Conservation and Natural Resources). (2) WPC completed and submitted the final report for this project in June 2003. The project report is a compilation of data collected during field surveys in the four parks (surveys for flora of special concern, mapping and description of plant communities, and insect trapping). In addition, WPC compiled information from the Pennsylvania Natural Heritage Program database for species of special concern that had been documented in the parks prior to the present study. The final report includes maps with locations of species of special concern, plant communities and other land use types, and locations of insect trapping sites. Also included are management recommendations for the protection of species of special concern and natural communities.

- **Scheduled FY 2004 Activities and Products:** Project completed in 2003. Data will be entered into NPSpecies, spatial layers received from cooperators, and metadata created.

Task 2.18 – Bluestone Vegetation Mapping and Floristic Inventory.
Parks Involved: BLUE

- **FY 2003 Accomplishments:** (1) In conjunction with vegetation mapping at BLUE, *Abies* Ecology initiated work on a floristic inventory for BLUE in 2003. They started by assembling information on previous plant collections from the park which resulted in a list of 83 taxa. Collection trips to the park started in April and continued through the summer in conjunction with plot sampling for vegetation mapping. They collected approximately 500 numbered specimens (many with duplicates) and to date have identified 140 taxa not previously documented by specimens from the park. The latter number will increase as they process and identify the rest of the specimens this winter.
- **Scheduled FY 2004 Activities and Products:** (1) *Abies* Ecology plans one more collection trip to BLUE in Fall 2003. Winter 2003-04 will be spent identifying specimens, entering label data, and determining data gaps and taxonomic problems to be addressed by fieldwork. They plan another full season of fieldwork for the floristic inventory in 2004.

Task 2.19 – Survey for Rare Plants at the Gauley River NRA.
Parks Involved: GARI

- **FY 2003 Accomplishments:** (1) West Virginia Division of Natural Resources' Wildlife Resources Section and Park Staff, with Park funding, completed all field surveys for the approximately 60 miles of shoreline in the NRA. Many sub-populations of the riparian species were documented and locations logged using the GPS system. Analysis of subpopulations, comparing data from 1991 and 2003, has not yet been completed. The most important species from a planning/management point-of-view are the Federally listed as Threatened Virginia Spiraea and the globally rare Barbara's Buttons. These species occur in the riparian zone and could be impacted by recreational activity. The cooperators found that getting GPS points in the steep gorge was often difficult due to time of day and consequent satellite positions. Considerably more time would be needed to visit each of the very remote populations at an opportune time to lock into a sufficient number of satellites to get the accuracy requested by the NPS. The Gauley Gorge is a remote and rugged landscape making field investigations difficult and at times dangerous.
- **Scheduled FY 2004 Activities and Products:** (1) The rare plant locations gathered during the growing season surveys will be analyzed, mapped and reported to the NPS by December, 2003.

Task 2.20 – Survey of Cliff-nesting Birds.
Parks Involved: NERI

- **FY 2003 Accomplishments:** (1) A cooperative agreement was established with the College of William and Mary, Dr. Bryan Watts, with regional funds from John Karish, to conduct a survey of cliff-nesting birds at NERI. Regional Science contributed partial funding to a larger Appalachian region research effort. (2) A systematic survey of the southern Appalachian Mountains, including NERI, will be designed and conducted to determine the status and distribution of cliff-nesting species with particular emphasis on peregrine falcons.

- **Scheduled FY 2004 Activities and Products:** (1) Surveys will be initiated/continue and may include NERI depending on logistics.

Task 2.21 – Assessment of Ambystomid salamander populations and their breeding habitats.
Parks Involved: DEWA
- **FY 2003 Accomplishments:** (1) DEWA received NRPP funds to work in conjunction with USGS Leetown Science Center, Dr. Craig Snyder, to conduct an assessment of Ambystomid salamander populations and their breeding habitats in DEWA. (2) Field work was concluding as of May 2003.
- **Scheduled FY 2004 Activities and Products:** (1) Data analysis and final report will be generated in FY04.

Task 2.22 – Aquatic Plant Inventory.
Parks Involved: DEWA & UPDE
- **Scheduled FY 2004 Activities and Products:** (1) Work with Park staff to develop and elicit a cooperator to assemble historic data on aquatic plants and utilize this information to design and conduct a quantitative inventory of aquatic plant biodiversity along the Delaware River.

Task 2.23 – Targeted Reptile and Amphibian Inventory.
Parks Involved: NERI GARI & BLUE
- **Scheduled FY 2004 Activities and Products:** (1) Work with Park staff to develop and elicit a cooperator to inventory several amphibian and reptile species (that are either difficult to inventory or were not adequately inventoried in the past) that may relate to future water quality vital sign selection (i.e., potential indicator species).

Task 2.24 – Bat Inventory.
Parks Involved: ALPO JOFL FONE & FRHI
- **Scheduled FY 2004 Activities and Products:** (1) Work with Park staff to develop and elicit a cooperator to inventory bat communities.

OBJECTIVE 3 – Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

Task 3.1 – Air Quality Summary Report
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE
- **Scheduled FY 2004 Activities and Products:** (1) NPS Air Resource Division's Tonnie Maniero will prepare the Eastern Rivers and Mountains Network air quality summary report. Data from the Air Quality Inventory, national air monitoring programs, and other air quality sources will be used in conjunction with park-specific resource information to evaluate the following needs relative to the ERMN: a) the need for additional ambient air quality monitoring at any Network park, i.e., wet deposition, dry deposition, visibility, and/or ozone monitoring, and b) the need for air quality effects-related monitoring at any Network park. The results of this evaluation, as well as a brief summary of results of past air quality monitoring at relevant sites, will be discussed.

Task 3.2 – Geologic Scoping Meeting, Report, and Digital Geology Map
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE

- **Scheduled FY 2004 Activities and Products:** (1) NPS Geologic Resource Division's Bruce Heise will coordinate scoping meetings during late June early July 2004 at all Eastern Rivers and Mountains Network Parks (except DEWA which has already had a Geology Scoping Meeting) to discuss geologic issues, evaluate current geologic maps, and initiate development of a digital geologic map for all Network Parks. Scoping report will be provided within 2 months of scoping workshop and a final report and digital map will be provided at a later date.

Task 3.2 – Paleo-Resources Inventory
Parks Involved: FONE FRHI ALPO JOFL DEWA UPDE NERI GARI BLUE

- **Scheduled FY 2004 Activities and Products:** (1) A cooperative agreement will be established with Vincent Santucci, NPS, to conduct an inventory of Paleo-resources for the network. A final report will be completed in FY04 that contains a narrative summary identifying the scope and significance of any paleo-resources for each network park; bibliographic searches for any paleo-related literature (both published and gray literature)for entry into NR Bib and the NPS Paleo Bibliographic database; dataset catalogs records for all past and current paleo related activities for each network park; and identifies any partnership information related to paleo activities.

Task 3.3 – Exotic Plant Inventory
Parks Involved: FONE FRHI ALPO JOFL

- **Scheduled FY 2004 Activities and Products:** (1) A cooperative agreement will be established with Western Pennsylvania Conservancy, Ephraim Zimmerman, to conduct an inventory of exotic plants. Initial work will be in conjunction with the existing vegetation mapping project and will involve a qualitative assessment of invasive plants. Additional work will involve updating/creating GIS maps and quantitative assessments of invasive plants in priority plant communities.

Task 3.4 – Fire Fuels Mapping
Parks Involved: NERI GARI BLUE

- **FY 2003 Accomplishments:** (1) A cooperative agreement with NC State was established to develop fire fuels maps for Acadia National Park (ACAD), Fire Island National Seashore (FIIS), NERI, GARI, and BLUE. (2) Using leaf-on and leaf-off photography, they will develop two fire fuels maps for each park representing "complacent" and "available live fuel" scenarios consistent with work that has been done at Shenandoah National Park. (3) They will create preliminary fire fuels maps by classifying the vegetation occurring in each park into one of the 13 NFFL fire fuel models based on their recent work at BOWA and GEWA.
- **Scheduled FY 2004 Activities and Products:** (1) They expect to receive vegetation data for NERI, GARI, and BLUE in the fall/winter of 2004-2005. NERI, GARI, and BLUE field data collection is scheduled for either summer 2004 and/or summer 2005, depending on when they receive the vegetation maps for these parks. Based on that schedule, they would

complete preliminary fire fuel maps for these parks by early spring of 2004. (2) Correction of the fire fuels maps for NERI, BLUE, and GARI will take place in fall 2004 and/or 2005, depending on when they are able to complete the field data collection. (3) Development of "available live fuel maps" for NERI, BLUE, and GARI will take place after the field data collection and the initial (complacent) fire fuels maps are completed.

Task 3.5 – Digital orthophoto mosaics
Parks Involved: ALPO, JOFL, FONE, FRHI, NERI, BLUE, GARI

- **FY 2003 Accomplishments:** A cooperative agreement with NC State was established to create digital orthophoto mosaics for nine national parks in the Northeast Region. In addition, they are assisting with developing specifications and quality assurance for aerial photography for ten additional Northeast Region parks. This task involves working with William Frament, Remote Sensing Specialist, USDA Forest Service, to develop specifications for obtaining aerial photography and to perform quality assurance checks of the aerial photography for each of the ten parks. (1) Aerial photography for all parks has been flown and accepted by Richard Easterbrook (2) Orthophoto mosaics have been completed for GETT/EISE, FONE, FRHI, and BLUE. A preliminary mosaic for GARI has been completed as well. (3) Work with William Frament, Remote Sensing Specialist, USDA Forest Service, to develop specifications for obtaining aerial photography and to perform quality assurance checks of the aerial photography obtained for ten NER parks.
- **Scheduled FY 2004 Activities and Products:** (1) NC State is currently working to create the NERI mosaic and the ALPO and JOFL mosaics will be started within the next month or so. The final mosaic for GARI is in progress. Accuracy assessment fieldwork for the West Virginia parks (NERI, BLUE, and GARI) is tentatively scheduled for October 2003. (2) Accuracy assessment fieldwork for the Pennsylvania parks (ALPO, JOFL, FONE, FRHI, and GETT/EISE) will take place in spring 2004. (3) NC State will acquire digital data files of official boundaries for all parks so they can check to see that the aerial photography covers each park in its entirety.

Task 3.6 – Vegetation Mapping at Delaware Water Gap NRA
Parks Involved: DEWA

- **FY 2003 Accomplishments:** PA Natural Diversity Inventory: (1) Completed initial air photo interpretation including formation level vegetation classification of park, (2) Conducted preliminary reconnaissance of air photo signatures, (3) Developed vegetation classification sampling design, (4) Completed approximately 75 % of vegetation classification field work by September 2003, and (5) Began data entry for plot data into a database.
- **Scheduled FY 2004 Activities and Products:** (1) Completion of vegetation classification fieldwork, (2) completion of plot data entry into databases, (3) data analysis and development of vegetation classification for Park, (4) development of alliance level vegetation map and fire fuel model maps for Park, (5) development of accuracy assessment sampling design, and (6) initiation of accuracy assessment sampling.

Task 3.7– Vegetation Mapping at Upper Delaware SRR
Parks Involved: UPDE

- **FY 2003 Accomplishments:** (1) Kucera International Inc. was awarded the contract to collect 1:12,000-scale, color infrared aerial photography, with airborne GPS and IMU

information for Upper Delaware Scenic and Recreational River Corridor plus an additional 2-mile buffer around the park (approximately 223,295 acres). (2) A cooperative agreement was established with PA Natural Diversity Inventory to conduct vegetation mapping on the Pennsylvania side of UPDE.

- **Scheduled FY 2004 Activities and Products:** (1) This leaf-off photography is scheduled to be flown in March of 2004. (2). PA Natural Diversity Inventory will conduct field work on the PA side of UPDE, (3) A cooperative agreement will be established with NY Natural Heritage Program to conduct vegetation mapping on the New York side of UPDE.

Task 3.8 – Vegetation Mapping at New River Gorge NR, Gauley River NRA, and Bluestone NSR
Parks Involved: NERI, GARI & BLUE

- **FY 2003 Accomplishments:** (1) Through an existing cooperative agreement with *Abies* Ecology, Inc (Brian Streets, Jim Vanderhorst, and Tom Vogt), plot data from the 2002 field season (95 plots) was entered and error checked and a standard plant nomenclature was applied to the entire Plots Database for NERI (260 plots and 462 observation points). Preliminary analysis of plot data using cluster analysis and ordination identified several distinctive groups and some data gaps. A few of these gaps were filled by plot sampling in August 2003 (7 plots) and they plan to sample a few more plots this fall to complete the field work for this project. Additional field time was dedicated to collecting GPS observation points to establish signatures for riparian and conifer types. (2) Work was initiated on vegetation mapping for BLUE in 2003. *Abies* Ecology developed an Ecological Land Unit (ELU) model for the park to stratify plot sampling and to assess vegetation patterns in relation to landscape features. This summer they sampled 55 plots and an additional 16 GPS observation points for distinctive types with sufficient plot samples. This completes the plot sampling budgeted for this project. (3) Accutech Surveying & Mapping (prime) and Sanborn Map Company Inc.(sub) were awarded the contract to collect 1:12,000-scale, color infrared aerial photography, with airborne GPS and IMU information for NERI, GARI and BLUE (approximately 87,000 acres). Project 1, which collected leaf-off aerial photography, was completed in March of 2003. Project 2, which will collect leaf-on aerial photography at peak fall foliage, is slated to be flown this October.
- **Scheduled FY 2004 Activities and Products:** (1) *Abies* Ecology will continue data analysis, complete the vegetation classification for NERI, and develop a key to associations. They had scheduled photo interpretation to be completed this fiscal year, but photography is not yet available in digital format. They will start photo interpretation when the imagery is received. They will utilize any time delay to develop association descriptions and begin preparation of the final project report. (2) *Abies* Ecology will enter the 2003 plot data and begin analysis to develop the vegetation classification for BLUE. Additional GPS points of known types to assist photo interpretation will also be collected. (3) Additional funding will be provided for additional plot sampling in 2004 due to the discovery of many new plant associations. This additional work can be completed in 2004 and will not affect the scheduled completion of vegetation mapping for BLUE in 2005. (4) A cooperator will be sought to conduct the veg mapping at GARI.

Task 3.9 – Vegetation map accuracy assessment for New River Gorge National Scenic River and Bluestone National Scenic River
Parks Involved: NERI & BLUE

- **FY 2003 Accomplishments:** A cooperative agreement was established with NC State to assess the thematic accuracy of alliance level vegetation maps created by the National Park Service for NERI and BLUE. They will: (1) Develop lists of all alliance level vegetation polygons for each park based on vegetation maps to be provided by the National Park Service, (2) Select stratified random sample of vegetation polygons for field data collection, (3) Collect field data from the maximum number of sites possible within the 12 days allocated for fieldwork, (4) Edit the alliance level vegetation maps based on accuracy assessment field data and develop FGDC Biological Data Profile metadata for the final, edited maps, and (5) Prepare a combined final accuracy assessment report including a description of procedures and results, error matrices, and copies of all related materials and forms including differentially corrected GPS coordinates of the field data collection sites in MS Access format and annotated field data collection forms.
- **Scheduled FY 2004 Activities and Products:** (1) The estimated completion date for the NERI alliance level vegetation map is September 30, 2004. Based on that schedule, they expect to complete the listing of NERI alliance level vegetation polygons by November 30, 2004. The BLUE alliance level vegetation map will be completed after the NERI map; they expect to complete the listing of BLUE alliance level vegetation polygons within six weeks of receipt of the vegetation map. (2) They expect to select the samples for field data collection in February-March 2005. (3) The earliest that field data collection will take place will be in the spring/summer of 2005. (4) Schedule will depend on completion of Task 3.

Task 3.10 – Vegetation Mapping at Four Western Pennsylvania National Parks
Parks Involved: ALPO, JOFL, FONE & FRHI

- **FY 2003 Accomplishments:** (1) Kucera International Inc. was awarded the contract to collect 1:6,000-scale, color infrared aerial photography, with airborne GPS and IMU information for ALPO, JOFL, FONE & FRHI, (and EISE and GETT) (approximately 9,002 acres). In March of 2003 this contract was completed when leaf-off aerial photography was collected. (2) PA Natural Diversity Inventory, through an existing cooperative agreement subcontracted to the Western Pennsylvania Conservancy, developed park specific scopes of work detailing tasks, deliverables and schedule of work for each park, (3) Held start-up meetings for FONE and FRHI (and EISE, and GETT), (4) Performed reconnaissance of park vegetation at FONE (and EISE, GETT), (5) Developed formation-level vegetation map for FONE using spring 2003 CIR aerial photography, (6) Developed vegetation classification sampling strategy for FONE based on formational level map, (7) Began and completed vegetation classification sampling at FONE.
- **Scheduled FY 2004 Activities and Products:** PA Natural Diversity Inventory will complete the following: (1) FONE: a) complete data entry and vegetation classification analyses, b) develop vegetation type descriptions and vegetation type key for parks, c) develop alliance-level vegetation map and accuracy assessment sampling strategy, d) complete thematic accuracy assessment during summer 2004 field season, e) begin accuracy assessment data entry and analyses, (2) FRHI: a) perform air photo interpretation, develop formation- level vegetation map and vegetation classification sampling strategy, b) begin and complete vegetation classification sampling during the summer 2004 field season, c) begin data entry into database, (3) JOFL: a) hold start-up meeting with park staff, b) perform air photo interpretation, develop formation- level vegetation map and vegetation classification sampling strategy, c) begin and complete vegetation classification sampling during the

summer 2004 field season, d) begin data entry into database, (4) ALPO: a) hold start-up meeting with park staff [no additional work scheduled until winter 2004-2005 when air photo interpretation work will begin].

Task 3.11 – Integrate newly collected vegetation plot data into the National Vegetation Classification (NVC) and to ensure adherence to the NPS Vegetation Mapping Program standards.
Parks Involved: DEWA, UPDE, ALPO, JOFL, FONE, FRHI, NERI & BLUE

- **FY 2003 Accomplishments:** (1) An agreement with NatureServe for all parks, except DEWA, was signed in June 2003 to conduct this work. (2) DEWA: PA Natural Diversity Inventory did not receive photography for veg mapping until late 2002, so this park is approximately one year behind schedule. NatureServe has had preliminary communications with PNDI regarding the timing of field work and other logistics.
- **Scheduled FY 2004 Activities and Products:** (1). Site visits will be planned during summer 2004 for JOFL and BLUE. NVC descriptions will be prepared for NERI upon consultation with the ecologist from *Abies* Ecology (NatureServe site visit was completed prior to 10/02). (2). DEWA: NatureServe will conduct field work with PA Natural Diversity Inventory at DEWA during their second year of field sampling in 2004, with the bulk of NatureServe's work to focus on integration of data in 2005.

Task 3.12 – Riparian Zone Assessment
Parks Involved: GARI

- **FY 2003 Accomplishments:** Park funds were used to establish a cooperative agreement with West Virginia Division of Natural Resources' Wildlife Resources Section to map and assess the natural condition and function of the riparian zone of the Gauley and Meadow rivers with relation to stream flow, sediment transport, natural vegetative riparian buffer, etc., within the Gauley River National Recreation Area. This project is being conducted in conjunction with Park staff. (1) This project was initiated in August 2003. Some aerial photography has been purchased to determine if available photography is suitable for mapping the riparian zone. If it is deemed to be inadequate they will look at ways to obtain original photography for the mapping. A twenty-five percent sub-sample of the zone will be analyzed for proper functioning condition and they are in the process of determining how to classify various reaches of the Gauley and Meadow Rivers so that the sub-sample will adequately represent all portions of the rivers.
- **FY 2004 Scheduled activities and products:** (1) Create and ground-truth initial map of riparian zone. Submit preliminary progress report to NPS, (2) Re-map riparian zone if necessary, (3) Assess 25 percent of riparian zone for Proper Functioning Condition using BLM protocols, and (4) Submit a draft report.

B. CORE VITAL SIGNS MONITORING

OBJECTIVE 4 - Hire and retain professional staff and secure office space and facilities.

Task 4.1 – Hire Network Coordinator and Data Manager
Parks Involved: ALL

- **FY 2003 Accomplishments:** (1) An ERM Network Coordinator and Data Manager were hired. (2) Based on a Board of Director's meeting in October 2002, Penn State University was the preferred option for a duty station for the network coordinator and data manager. The Penn State location was approved January 2003.
- **Scheduled FY 2004 Activities and Products:** (1) Through a cooperative agreement with Penn State University, office space will be maintained in the School of Forest Resources.

OBJECTIVE 5 - Develop and maintain working and decision-making processes that engage the Board of Directors, Science Advisory Committee, technical staff, and managers of Network parks.

Task 5.1 – Board of Directors and Network Charter
Parks Involved: ALL
- **Scheduled FY 2004 Activities and Products:** (1) Board of Directors membership will be updated to reflect the recent and upcoming changes in Park Superintendents. (2) The Network Charter will be re-drafted and approved to reflect these changes and to (3) incorporate the designation of the ERMN Data Manager as the POC for NPSpecies. (4) A BOD meeting will be scheduled for January to review activities and discuss FY04 workplan.

Task 5.2 – Science Advisory Committee
Parks Involved: ALL
- **Scheduled FY 2004 Activities and Products:** (1) Park superintendents, resource managers, resource specialists and site managers for parks, as well as the regional chief scientist and regional I&M coordinator, will be consulted to continue the establishment of a Science Advisory Committee. (2) A Science Advisory Committee meeting will be held to discuss Network activities, review background materials, and plan future for vital signs scoping sessions.

Task 5.3 – Site Visits with Natural Resource Staff
Parks Involved: ALL
- **FY 2003 Accomplishments:** (1) Newly hired ERMN Coordinator, Data Manager and Research Associate made site visits to ALPO, JOFL, FONE, FRHI, DEWA and UPDE to meet with Natural Resource Staff to discuss park issues, natural resource threats, current projects, and potential vital signs. Park specific follow-ups to these meetings are ongoing.
- **Scheduled FY 2004 Activities and Products:** (1) ERMN Coordinator, Data Manager and Research Associate will made site visits to NERI, GARI, and BLUE in November to meet with Natural Resource Staff to discuss park issues, natural resource threats, current projects, and potential vital signs. (2) Additional visits to all Network Parks will occur in 2004 for scoping and inventory project oversight and assistance.

OBJECTIVE 6 - Summarize existing data, identify, and prioritize all indicators, then develop protocols and implement programs to monitor the Vital Signs.

Task 6.1-Summarize Existing Data and Identify Potential Indicators.
- **FY 2003 Accomplishments:** (1) Newly hired ERMN Coordinator, Data Manager and Research Associate made site visits to all Network Parks to meet with Natural Resource Staff

to discuss park issues, natural resource threats, current projects, and potential vital signs as they pertain to water quality.

- **Scheduled FY 2004 Activities and Products:** (1) Continue to hold informal and formal meetings with Park resource managers, cooperators, and members of the Science Advisory Committee that are actively involved with natural resource management within Network Parks. (2) Under a cooperative agreement with Penn State University, a Research Associate (Jennifer DeCecco) will summarize enabling legislation, existing monitoring programs, important natural resources, and ecologically significant "stressors" that have the potential to impact natural resources within network parks. A draft of this report will completed in November 2003 (3) Begin compiling existing data, begin an analysis of the adequacy of current monitoring (by NPS or others), and acquire published resources on these topics.

Task 6.2-Develop Conceptual Models for Important Ecosystems.

- **Scheduled FY 2004 Activities and Products:** (1) Develop conceptual models for important terrestrial systems that elucidate system drivers, potential stressors, key components, potential indicators and how those indicators are related to potential stressors. (2) Work with Park Staff and Science Advisory Committee to elicit and attain a cooperator to develop conceptual models for important ecosystems.

OBJECTIVE 7 - Implement and maintain an integrated GIS and data management program (Note: this objective is placed under Vital Signs Monitoring, however, it is equally important and integrated with the Biological Inventories portion of the program.).

Task 7.1 – NC State: GIS Data Management System Design and Implementation

- **FY 2003 Accomplishments:** A cooperative agreement was established with NC State for a GIS data management system design. The overall objective of this project is to assist with the design and implementation of data management systems for the Northeast Region Inventory and Monitoring (I&M) Program. The project includes four central activities: (1) providing research support to I&M biological inventory projects; (2) reviewing and creating digital orthophoto mosaics; (3) compiling and distributing base GIS data; (4) and developing vegetation map data review procedures.
- **Scheduled FY 2004 Activities and Products:** (1) During the first year of this project NC State expects to provide research support to 25-30 I&M Program biological inventory projects that will include: Verifying that each scientist is working with the appropriate GIS base data; Reviewing tabular data from each project for compatibility with the national data structure following the Natural Resource Database Template and assisting with soliciting any missing information; Assisting each scientist to assure that all information necessary for completing fully compliant metadata is available and taking a lead role in constructing metadata records; and Constructing the appropriate NPS Dataset Catalog records and Microsoft Word formatted data dictionaries for each project. (3) NC State expects to develop distribution procedures and distribute base GIS data to at least 6 parks during the upcoming fiscal year. At a minimum, base GIS data will include the following layers, in their latest and highest available resolution, with FGDC compliant metadata: 1.Park Boundary, 2.Digital Orthphoto Quarter Quadrangles (DOQQ's) in MrSID format, 3.Digital Elevation Models (DEM's), 4.Digital Raster Graphics (DRG's) in MrSID format, 5.All available vector base data (roads, trails, hydro, contours, facilities, shorelines, etc.).

Task 7.2-Relational database development for park inventories

- **Scheduled FY 2004 Activities and Products:** (1) Continue to convert existing inventory data to relational access databases and assist cooperators in developing FGDC compliant metadata following the biological profile. (2) Provide these Access databases to parks, and assist park staff in developing data entry forms for further use for park inventories.

Task 7.3-Archive data sets and reports

- **Scheduled FY 2004 Activities and Products:** (1) Develop archival procedures for incoming biological data, including vegetation mapping field forms, plots data and reports. (2) Identify data storage sites. (3) Initiate a scanning and document creation effort to catalog and store electronic copies of current and historic documents.

OBJECTIVE 8 - Develop and maintain strategies to share information with Network parks, scientists, and others interested in the Network's I&M program, and to contribute to general management planning, educational programs, and learning centers for Network parks.

Task 8.1-ERMN Web-based Information Sharing

- **Scheduled FY 2004 Activities and Products:** (1) An existing cooperative agreement between the NCBN and URI Environmental Data Center will be modified for initial development of a Webpage for the ERMN. This webpage will also be linked to the National I&M Program and will be a centralized place for Network Parks, Scientists, and others interested in the Network's I&M Program to receive information. (2) ERMN Data Manager will assume development, management and oversight responsibilities of the website after the initial effort by URI Environmental Data Center.

Task 8.2-Contribute to General Management Planning

- **FY2003 Accomplishments:** (1) A FY02 proposal developed by senior scientists in the Northeast Region was submitted and funded by the WASO planning office. The purpose of this proposal was to synthesize and interpret existing natural resource information and studies to better inform park planning at NERI. NERI is scheduled to begin its GMP in 2004/5.
- **Scheduled FY 2004 Activities and Products:** (1) Northeast Region I&M staff and the ERMN Coordinator and Data Manager will continue to assist regional scientists, CESU staff, park staff and planners with General Management Planning activities as appropriate.

C. WATER QUALITY MONITORING

OBJECTIVE 9 - Summarize existing data, identify and prioritize all aquatic indicators, and develop protocols and implement programs to monitor the Water Quality Vital Signs.

Task 9.1-Summarize existing data.

- **FY 2003 Accomplishments:** (1) Newly hired ERMN Coordinator, Data Manager and Research Associate made site visits to all Network Parks to meet with Natural Resource Staff to discuss park issues, natural resource threats, current projects, and potential vital signs as they pertain to water quality.

- **Scheduled FY 2004 Activities and Products:** (1) Continue to hold informal meetings with resource managers that are actively involved in water quality in network parks. (2) Work with Park Staff and Science Advisory Committee to develop a proposal to do the following a) compile information on state-identified impaired (305b and 303d-listed) waters within network parks, b) compile information on state-identified outstanding waters, or special protection waters, c) compile information on other water bodies in the network not officially recognized as such, but that are thought to be both pristine and ecologically highly significant at the park or Network scale, and d) identify ecologically significant "stressors" that have the potential to impact water quality within network parks.

Task 9.2-Develop a Science Advisory Committee with expertise in water quality monitoring.
- **Scheduled FY 2004 Activities and Products:** (1) Develop a section of the Science Advisory Committee with expertise in water quality monitoring.

Task 9.3- Identify and acquire published resources on water quality monitoring
- **Scheduled FY 2004 Activities and Products:** (1) Identify and acquire published resources on water quality monitoring that may assist in developing a water quality monitoring program. (2) Identify examples of monitoring templates, and strategies used by other networks, prototype parks, or regulatory agencies.

Task 9.4-Develop Conceptual Models for Important Aquatic Systems.
- **Scheduled FY 2004 Activities and Products:** (1) Develop conceptual models for important aquatic systems that elucidate system drivers, potential stressors, key components, potential indicators and how those indicators are related to potential stressors. Conceptual models for larger river systems and smaller tributary watersheds will be developed.

Task 9.5-Conduct Level 1 Water Quality Monitoring.
Parks Involved: ALPO, JOFL
- **Scheduled FY 2004 Activities and Products:** (1) Work with Gary Rosenlieb, WRD, and Park staff to develop proposal and elicit cooperator to conduct a Level 1 Water Quality assessment.

III. Staffing

Inventory and Monitoring Staff

Matt Marshall, ERMN Coordinator
Nathan Piekielek, ERMN Data Manager
Jennifer DeCecco, Research Associate, PSU
Jennifer Keefer, Research Associate, PSU
Janice Lynch, Research Associate, PSU
Scott Tiffney, Research Associate, PSU

Board of Directors

Keith Newlin, Superintendent - ALPO & JOFL
David Forney, Superintendent - UPDE
John Donahue, Superintendent - DEWA
Calvin Hite, Superintendent - NERI, GARI, & BLUE
Ken Mabery, Superintendent - FONE & FRHI
John Karish, Chief Scientist PHSO
Elizabeth Johnson, Northeast Region I&M Coordinator

Science Advisory Committee (partial)

Tonnie Maniero, NPS Air Resource Division
Alan Ellsworth, NPS NER Hydrologist
Jeff Runde, NPS NCR/NER Aquatic Ecologist
Duane Dieffenbach, USGS PA Cooperative Fish and Wildlife Research Unit
John Karish, NPS NER Chief Scientist
Elizabeth Johnson, NPS Northeast Region I&M Coordinator
Matt Marshall, NPS ERMN Coordinator

Cooperators and Contractors

Vincent Santucci - NPS
North Carolina State University - Dr. Hugh Devine and Bill Slocumb
College of William and Mary - Dr. Bryan Watts
University of Georgia - Dr. Steven Castleberry
Marshall University - Dr. Tom Pauley
Marshall University - Dr. Ralph Taylor and Dr. Tom Jones
East Stroudsburg University - Dr. Terry Master
East Stroudsburg University - Dr. Howard P. Whidden
Penn State University - Dr. Richard Yahner and Brad Ross
Penn State University - Dr. Jay Stauffer and Tim Stecko
California University of PA - Dr. Brian Paulson
USDA Forest Service - Dr. Mark Ford
USGS, WV Cooperative Fish and Wildlife Research Unit - Dr. Petra Wood

USGS, WV Cooperative Fish and Wildlife Research Unit - Dr. Stuart Welsh
USGS Leetown Science Center - Dr. Craig Snyder
Wildlife Conservation Society - John Behler
Academy of Natural Sciences of Philadelphia - Dr. Richard Horwitz and Paul Overbeck,
NatureServe - Lesley Sneddon
Abies Ecology, Inc. - Brian Streets, Jim Vanderhorst, and Tom Vogt
PA Natural Diversity Inventory (PANDI) - Greg Podniesinski and Stephanie Perles
Western Pennsylvania Conservancy – Ephraim Zimmerman
NY Natural Heritage Program - Greg Edinger and Aissa Feldman
West Virginia DNR Natural Heritage Program – Brian McDonald
Accutech Surveying & Mapping, Inc.
Kucera International, Inc.

IV. Reports, Publications and Presentations

Reports and Publications

Behler, J., David B., and R. Cook. 2003. Draft report-Paired Hemlock-Hardwood Stream Salamander Survey Delaware Water Gap National Recreation Area: An Analysis of Species Distribution and Relative Abundance in Different Stream Types.

Castellano, C. M., J. L. Behler, R. P. Cook, D. K. Brotherton. 2003. National Parks in the Northeast: Preserving America's Herpetological Heritage. Herpetological Review. 34(3), 192-193.

Devine, Hugh A. 2003. "Predicting Fire Fuel Models from National Vegetation Inventory Data." Presentation at the Northeast Region Fire Management Officer's Workshop. Boston, MA.

Lellis, W. A. 2003. Fresh Water Mussel Survey of the Delaware Water Gap NRA: Qualitative Survey 2001.

Master, T. L. 2003. Progress Report #1, A Point count Survey of Grassland Birds in the Delaware Water Gap National Recreation Area.

Master, T. L. 2003. Progress Report #2, A Point count Survey of Grassland Birds in the Delaware Water Gap National Recreation Area.
Ross, B.D., R.H. Yahner, J. Karish, D.S. Klute, and G.S. Keller. 2003/04. Inventory program for birds at Pennsylvania National Parks. Pennsylvania Birds. (in press).

Ross, B.D., D.S. Klute, G.S. Keller, R.H. Yahner, and J. Karish. 2003. Inventory of birds at six national parks in Pennsylvania. Journal of the Pennsylvania Academy of Science. 77(1):20-40.

Smith, Mark P. 2003. Predicting fuel models and subsequent fire behavior from vegetation classification maps. Master of Science thesis. North Carolina State University. 141pp.

Yahner, R.H., J. Karish, B.D. Ross, D.S. Klute, G.S. Keller, and. 2003/04. Comprehensive inventory program for birds at six Pennsylvania National Parks. Park Science. (in press).

Western Pennsylvania Conservancy. 2003. Plant community mapping and surveys for species of special concern at Allegheny Portage Railroad National Historic Site, Johnstown Flood National Memorial, Fort Necessity National Battlefield, and Friendship Hill National Historic Site. Final report to National Park Service, Cooperative Agreement 4560A0055. Pittsburgh, PA.

Presentations

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V. Status of Park Vital Signs Monitoring

Eastern Rivers and Mountains Network 2003	Air Quality	Water Quality	Water Quantity	Geologic Resources	Plants	Animals	Landscape Characteristics
Planning and Design							
# parks monitoring w/ NRC funding	9	9	9	9	9	9	9
# parks monitoring w/ other funding	3	6	4	0	3	8	1
Protocols Implemented							
# parks monitoring w/ NRC funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	3	6	4	0	3	8	1
Analysis/Synthesis Available							
# parks monitoring w/ NRC funding	0	0	0	0	0	0	0
# parks monitoring w/ other funding	3	6	4	0	3	8	1

Air Quality

- ALPO – National Atmospheric Deposition Monitoring Network/Mercury Deposition Monitoring (NPS)
- NERI – Ozone Passive Sampler Monitoring Program (NPS)
- DEWA - National Atmospheric Deposition Monitoring Network/Mercury Deposition Monitoring (Forest Service - in Milford, PA)

Water Quality

- UPDE – Delaware River Basin Commission monitors chemical parameters monthly (April-Nov) at 23 sites (9 main, 14 trib)

- DEWA – 1) Delaware River Basin Commission monitors the mainstem 2) USGS is conducting a study on the tributaries of the park. 3) NAWQA sites (don't know if they will resample those sites).
- NERI – 1) Fecal coliform, air and water temperatures, pH, specific conductance, turbidity and dissolved oxygen sampled monthly. Metals and alkalinity are sampled quarterly. A Hydrolab Datasonde installed in the New River at Thurmond monitors pH, DO, conductivity and water temperature every hour between April and October (NPS). 2) NAWQA sites will not be resampled.
- GARI - Fecal coliform, air and water temperatures, pH, specific conductance, turbidity and dissolved oxygen sampled monthly. Metals and alkalinity are sampled quarterly.
- BLUE - Fecal coliform, air and water temperatures, pH, specific conductance, turbidity and dissolved oxygen sampled monthly. Metals and alkalinity are sampled quarterly.
- ALPO – Water quality (basic chemical parameters) monitored by Senior Environment Corps (through DEP) at Blair Gap Run.

Water Quantity
- DEWA – USGS River Master – streamflow data (stations at Montague, Flatbrookville, Port Jervis and DEWA)
- UPDE - USGS River Master – streamflow data (stations at Port Jervis and Barryville, NY)
- NERI – USGS River Master – streamflow data (stations at Hinton and Thrumond, WV)
- GARI – USGS River Master – streamflow data (Summersville Dam, WV)

Geologic Resources
- None that we are aware.

Plants
- ALPO – exotics (NPS)
- JOFL – exotics (NPS)
- DEWA – Biocontrol of purple loosestrife management (NPS)

Animals
- ALPO – 1) Gypsy moth aerial surveys (Forest Service), 2) Macros at Blair Gap Run (Senior Environment Corps (DEP))
- JOFL - Gypsy moth aerial surveys (Forest Service)
- FONE - Gypsy moth aerial surveys (Forest Service)
- FRHI - Gypsy moth aerial surveys (Forest Service)
- DEWA – 1) wintering and nesting bald eagles (NPS), 2) BBS and CBC route (USGS and Audubon), 3) Hemlock monitoring (Forest Service), 4) Macros (DRBC)
- UPDE – 1) wintering and nesting bald eagles (NYSDEC), 2) Timber rattlesnake monitoring (NYSDEC), 3) Zebra mussel monitoring (w/ PA DEP), 4) Mussel monitoring (?), 5) Macros (DRBC)
- NERI – 1) biota of the New River (NPS/Virginia Tech – LTEMS); 2) Adelgid Monitoring Program 3) effects of *Bti* to control black flies (Virginia Tech)
- GARI - Adelgid Monitoring Program.

Landscape Characteristics

- EMAP completed a landscape characteristics assessment a few years ago for the entire region. Not sure if they plan to reassess on a regular basis.
- DEWA - USGS Tributary Study evaluated landscape characteristics in several watersheds.

VI. USGS Protocol Development and Monitoring-Related Research Needs

Statistical review of water quality data collected under existing monitoring programs. Assist development of water quality monitoring sampling design based on these, and other, analyses.

Land use land cover change analysis as it relates to monitoring changes in water quality.

Assist in the development of conceptual models for rivers and tributaries.

VII. Budget Narrative and Budget Printouts

In FY2003, the ERMN received $775,406 in funding, including Inventory and Monitoring funds, regional science funds, and fee-demo projects. Approximately 90 percent of these funds were used for I&M inventory, monitoring and vegetation mapping projects (79% I&M cooperative agreements and 9% I&M contracts, fee-demo, and support from Regional Science). The Network Coordinator and Data Manager were hired relatively late in the fiscal year, and thus, contributed little to the expenses. Computers and a printer were purchased for the Coordinator and Data Manager in with FY03 funds, and the I&M Program will contribute funds to the School of Forest Resources at Penn State University to house and administratively support I&M staff.

We anticipate the authorization of $788,100 in FY2004. We estimate that about 72 percent of our budget will be dedicated to I&M inventory, monitoring and vegetation mapping projects. The increase in personnel expenses reflects the full annual salaries and benefits of the Coordinator and Data Manager. We anticipate some additional one-time purchases of equipment and the I&M Program will continue to contribute funds to the School of Forest Resources at Penn State University to house and administratively support I&M staff.

A summary of our FY2003 expenditures and FY2004 budget plans is provided on the following pages.

Appendix 1. Summary of Major Accomplishments

Eastern Rivers and Mountains Network – The Eastern Rivers and Mountains Network (ERMN) includes ten parks located in four states: New York, New Jersey, Pennsylvania, and West Virginia. The park units include New River Gorge National River, Bluestone National Scenic River, Gauley River National Recreation Area, Johnstown Flood National Memorial, Fort Necessity National Battlefield, Friendship Hill National Historic Site, Upper Delaware Scenic and Recreational River, Delaware Water Gap National Recreation Area, and Allegheny Portage Railroad National Historic Site. A relatively small segment of the Appalachian Trail in PA and NJ is included in the ERMN, but trail activities associated with the Inventory and Monitoring Program are currently coordinated by the Northeast Temperate Network. The ERMN parks range in size from approximately 66 to 30,000 hectares and generally consist of a mosaic of forested hillsides and floodplains, streams and rivers, tallus slopes and cliffs, vernal pools and wetlands, open fields, and agriculture. The river parks contain some of the most significant water resources and water-based recreational activities in the national park system. These parks are not immune to a variety of natural and anthropogenic disturbances that affect, or have the potential to affect, park resources. Knowing the condition of natural resources and potential stressors is fundamental to protecting and managing National Park Service lands. Scientifically credible data are necessary to make decisions and support management actions. The purpose of the Inventory and Monitoring Program is to develop broadly based, scientifically sound information on the current status and long-term trends in the composition, structure and function of park ecosystems.

FY 2003 Network Objectives for Inventories

1. Locate and catalog Network park natural resource documents, data sets, and spatial information and ensure such information is accurate, readily available, and entered into NPS databases.
2. Conduct inventories targeted at taxonomic groups that are below the service-wide goal of 90% verification, or are of special concern to Network parks.
3. Conduct other baseline inventories identified as important to Network parks and the Network Vital Signs program.

Summary of Major Network Accomplishments During FY 2003 – Projects that are ongoing in the Network include compiling and entering existing and legacy data into the three WASO databases (NPSpecies, NatureBib and the Dataset Catalog). Two research associates and one volunteer are working to complete legacy data entry for the Network. The cooperative agreement with Penn State University to update Naturebib for the four Northeast Region Networks, including the ERMN has been extended, and the research associate has been visiting each park to search for new documents and update existing information. Numerous vertebrate and vascular plant inventories are being conducted in each park, and some aspect of the vegetation mapping effort is underway in all nine parks.

The biotic inventory projects continue to produce important results:

- Continuing avian and mammalian inventories at two small cultural parks, Fort Necessity National Battlefield and Friendship Hill National Historic Site in western Pennsylvania, illustrated the importance of protected areas for species of concern. Rich Yahner, Brad Ross, and Penn State investigators surveyed bird populations and documented 127 and 138 bird species at Fort Necessity National Battlefield and Friendship Hill National Historic Site, respectively. A total of 27 bird species were of special concern, including five state vulnerable species, two state threatened species, and one federally threatened species.

- The Pennsylvania Natural Heritage Program discovered an unusual vernal pool atop Kittatinny Ridge, east of Delaware Water Gap, where the substrate consisted of large boulders (as opposed to blackened leaf litter typical of vernal pools). They observed large numbers of fairy shrimp, dragon flies and other invertebrates. This area was noted for potential future rare invertebrate surveys.

- The Gauley River National Recreation Area has a high proportion of non-native fishes, a finding consistent with the fish species composition of the New River watershed (North Carolina, Virginia, and West Virginia). The distribution ranges of non-native darters (rainbow darter and variegate darter) and minnows (telescope shiner and whitetail shiner) have expanded within GARI, and the southern redbelly dace was collected from a Gauley River National Recreation Area tributary, representing a new introduced species within the Gauley River drainage.

The vegetation mapping and floristic inventory projects continue to produce important results:

- Numerous stands of an unusual calcareous slope forest type dominated by *Quercus muhlenbergii* (chinquapin oak) were documented at Bluestone National Scenic River.

- Two plant taxa tracked as rare by WV Natural Heritage Program, *Monarda fistulosa* var. *brevis* (smokehole bergamont) and *Viburnum rafinesguianum* (downy arrow-wood.), were found to occur extensively in oak-hickory forests at Bluestone National Scenic River.

- Additional stands of an unusual high floodplain forest type dominated by oaks, previously known from just one site, were discovered and sampled in New River Gorge National River.

- Old growth forest stands were discovered and sampled in Bluestone National Scenic River and New River Gorge National River.

- Three species tracked as rare by WV Natural Heritage Program, *Baptisia australis* (false indigo), *Carex emoryi* (one tough sedge), and *Vitis rupestris* (sand grape) were found to occur extensively and abundantly in scoured woodlands and prairies along the New River Gorge National River.

- *Viola appalachiensis* (Appalachian blue violet), a Pennsylvania Threatened species, was documented in Johnstown Flood National Memorial during this study.

- Three plants of special concern not known from Friendship Hill National Historic Site prior to this study were documented there during the course of this study: *Aconitum uncinatum* (blue monkshood, Pennsylvania Threatened), *Chasmanthium latifolium* (wild oat), and *Eupatorium coelestinum* (mistflower). Two naturally occurring colonies of *Oxydendron arboreum* (sourwood) were also documented during this study. This species had been documented in Friendship Hill National Historic Site previously, but it was later determined that that occurrence was probably cultivated.

- The Gauley River gorge is home to a federally threatened plant, Virginia Spiraea (*Spiraea virginiana*). This shrub occurs along high-energy rocky river banks in the southern Appalachian Mountains and may be at risk because of loss of habitat due to damming of rivers. Another globally rare species, Barbara's Buttons (*Marshallia grandiflora*), occupies similar habitat in the gorge. Preliminary information indicates that this species occurs sporadically throughout the riparian areas of Gauley River National Recreation Area, which is good news.

FY 2003 Network Objectives for Vital Signs Monitoring

4. Hire and retain professional staff and secure office space and facilities.
5. Develop and maintain working and decision-making processes that engage the Board of Directors, Science Advisory Committee, technical staff, and managers of Network parks.
6. Summarize existing data, identify, and prioritize all indicators, then develop protocols and implement programs to monitor the Vital Signs.
7. Implement and maintain an integrated GIS and data management program (Note: this objective is placed under Vital Signs Monitoring, however, it is equally important and integrated with the Inventories portion of the program.).
8. Develop and maintain strategies to share information with Network parks, scientists, and others interested in the Network's I&M program, and to contribute to general management planning, educational programs, and learning centers for Network parks.

Summary of Major Network Accomplishments During FY 2003 – In FY 2003, the network received start up funds to hire a network coordinator and data manager. The Board agreed on Penn State University as a duty station for network staff. Matt Marshall was recently hired to fill the Network Coordinator position and Nathan Piekielek will fill the Data Manager position. Matt recently completed a two-year Post-Doctoral position in the School of Forest Resources at Penn State University. He taught courses in Vertebrate Ecology and Conservation Biology and also conducted research on sampling methods and population dynamics of grassland sparrows. Prior to this Matt spent eight years working in Virginia and West Virginia on a long-term, ecological field experiment investigating the effects of various gypsy moth management strategies on non-target organisms (native insects, salamanders, and forest birds). Matt received his Doctorate from the University of Georgia as part of this project. Nathan received his Master's from University of Georgia's Institute of Ecology in Conservation Ecology and Sustainable Development as part of a Long Term Ecological Monitoring urban watershed project. He has excellent GIS and database skills to match his knowledge of natural resources.

Prior to hiring Matt, a Cooperative Agreement was established with Penn State University to assist the Network in pulling together information required for a timely submission of a Phase I report on monitoring program planning. Jennifer DeCecco was highly recommended and was hired as a research associate under this agreement. She is compiling information on the important natural resources to the parks, management issues, and threats/stressors to the park's ecosystem and existing monitoring programs. This data will be used to generate monitoring questions and identify the "vital signs" or indicators of ecosystem health that will be considered in developing the long-term monitoring program.

Matt, Nathan, and Jennifer have visited Fort Necessity National Battlefield, Friendship Hill National Historic Site, Allegheny Portage Railroad National Historic Site, Johnstown Flood National Memorial, Delaware Water Gap National Recreation Area, and Upper Delaware Scenic and Recreational River this fall to meet the Natural Resource staff and begin discussions on important natural resources to the parks, management issues, existing monitoring programs, and threats/stressors to the park's ecosystem. A similar trip is planned for the first week in November to the New River Gorge National River, Bluestone National Scenic River, and the Gauley River National Recreation Area.

Park superintendents, resource managers, resource specialists and site managers for parks, as well as the regional chief scientist and regional I&M coordinator, will be consulted to continue the establishment of a Science Advisory Committee that will help guide the development of the monitoring program.